

Inventions & Innovation Project Abstract

Wind Fins: Novel Lower-Cost Wind Power System

This project serves to conclusively determine the technical feasibility of the Wind Fin technology. Specific objectives are: (1) Determine the wind energy-conversion performance of the Wind Fin and the degree to which this performance can be enhanced through basic design improvements. (2) Determine how best to design the Wind Fin system to survive extreme winds. (3) Determine the cost-effectiveness of the best Wind Fin designs. (4) Develop conclusions about the overall technical feasibility of the Wind Fin system.

The “Wind Fin” technology exploits the kinetic energy of an aerodynamic, oscillating panel system, rather than rotating wind turbines. There are three major components of this patent-pending technology: (1) a mast, (2) a vertical, hinged panel, and (3) an innovative power-extraction system. The hinged panel responds to the wind with an oscillating motion. The system is able to rotate freely around the mast and will automatically swing to orient itself downwind. It is self-starting. The power-extraction system is concentric with the mast. When the wind blows, the panel oscillates, and the oscillating motion of the panel turns a generator, producing electricity. The Wind Fin technology was initially developed as a visually pleasing alternative to wind turbines. It allows for designs that are more compatible with existing architectural forms as well as able to blend more readily into the natural landscape. Furthermore, its basic structural design virtually eliminates lethality to birds and bats. Preliminary wind-chamber tests and computer modeling have shown that this new technology will be comparable if not superior in performance to current state-of-the-art wind turbines of similar size—at approximately half the system cost. Further, these tests indicate that this new wind-power technology will be technically and economically feasible for use at many different scales—from small-scale distributed wind systems up to large, utility-scale systems.

This technology has the potential to harvest wind energy much more cost-effectively than wind turbines, significantly lower the purchase price of wind-energy systems, increase the technical and economic viability of wind-power generation, eliminate lethality to birds and bats, overcome public objections to the aesthetics of wind-power machines, and significantly expand wind-power’s contribution to the national energy supply.



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